SES21-2021-000218

Abstract for an Invited Paper
for the SES21 Meeting of
the American Physical Society

Few-Body Physics in Finite Volume

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Simulating quantum systems in a finite volume is a powerful theoretical tool to extract information about them. The pioneering work of Lscher has shown that the real-world properties of the system are encoded in how its discrete energy levels change with the size of the volume. This approach is relevant not only for nuclear physics, where lattice methods are now able to calculate few- and many-nucleon states, but also for other fields such as simulations of cold atomic systems. In this talk, I will present recent progress that has been achieved in this area. In particular, I will discuss the case of charged particles in a finite periodic box, which is of particular relevance for nuclear physics because the vast majority of systems of interest in this field involve more than one charged particle. This work is supported in part by the National Science Foundation under Grant No. PHY-2044632. This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of Nuclear Physics, under the FRIB Theory Alliance award DE-SC0013617.